

Briefing 13862  
only

I am aware that there is foreign intelligence interest in open source publications. I have sufficient technical expertise in the subject matter of this paper to make a determination that the net benefit of this public release outweighs any potential damage.

Reviewer: Mitch Kozera GS-13 Team Leader  
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Mitch Kozera 05/21/03  
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## Description of Information Reviewed:

Title: Pervasive Computing (PvC) and Its Impact on Next Generation Army Systems

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## Reviewer's Determination (circle one):

1. Unclassified Unlimited.

2. Unclassified Limited, Dissemination Restrictions IAW \_\_\_\_\_

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# Pervasive Computing (PvC)

...and Its Impact on Next  
Generation Army Systems

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# Agenda

- ❖ Pervasive Computing (PvC)
- ❖ PvC: It's Role in the Enterprise
- ❖ Convergence: A PvC Enabler
- ❖ Open Services Gateway Initiative (OSGi)
- ❖ Pervasive Device Software Architecture
- ❖ Back-End PvC Architecture
- ❖ Current Army Enterprise IT Architecture
- ❖ Middleware – A Foundation Upon Which to Build
- ❖ Enterprise IT – Its Impact on the Army



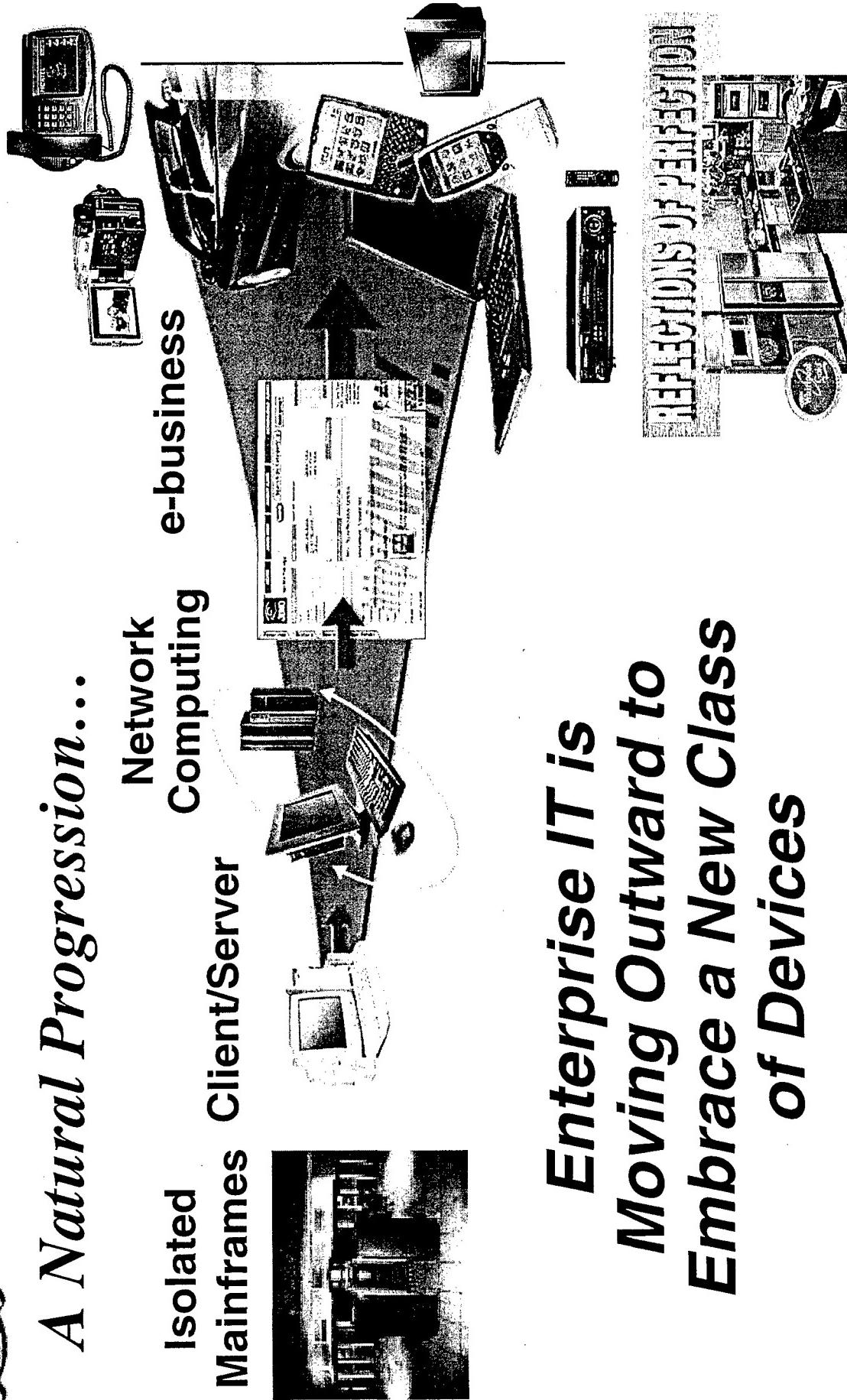
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# Pervasive Computing (PvC)

*A Natural Progression...*

**Isolated Mainframes**   **Client/Server**  
**Network Computing**   **e-business**



**Enterprise IT is  
Moving Outward to  
Embrace a New Class  
of Devices**



# Pervasive Computing is...

*Convenient access,*

through a new class of device,

to *relevant* cross-enterprise information

with the ability to *easily* take action on it  
when and where required.



*"...a billion people interacting with a million  
e-businesses with a trillion intelligent devices  
interconnected ..." (L.V.Gerstner)*

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# What's an IDE\*?



## *It's Enterprise Computing & E-Business!*

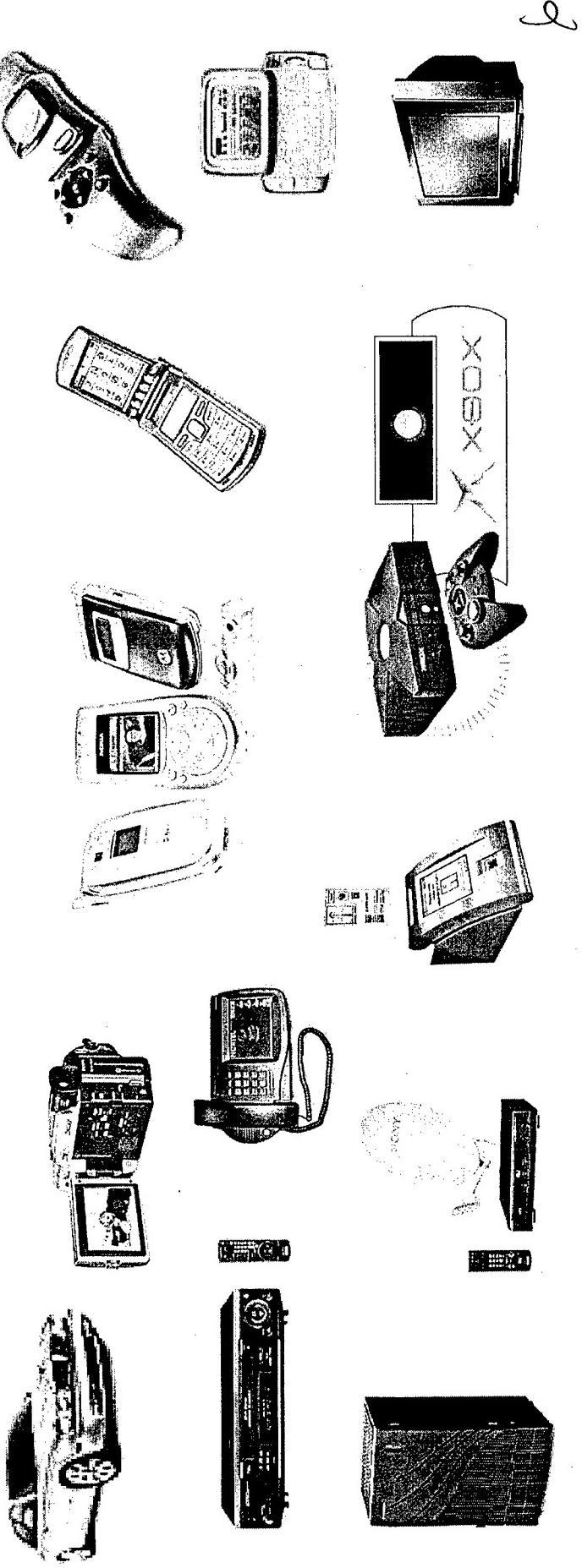
- ❖ Enterprise Middleware
  - ✓ Enterprise Application Integration (EAI)
  - ✓ Pervasive Computing (PvC),
  - ✓ Foundation for Net-Centric Application Development
- ❖ Business Process Integration/Management (BPI/M),
- ❖ Knowledge Management (KM),
- ❖ Enterprise Content Management (ECM)
- ❖ Supply Chain Management (SCM),
- ❖ Customer Relationship Management (CRM),
- ❖ Product Life-Cycle Management (PLM),
- ❖ Enterprise Resource Planning (ERP),
- ❖ Legacy Software, etc.

\*: Integrated Data Environment



# “Convergence:” Blurring of the Lines Between Products, Industries & Organizations

- ❖ Standards, Technologies & Products are Crossing Vertical Industries (IT, Telecom, CEs & CPs), &
  - ❖ Creating a Seamless IT Infrastructure From the Enterprise Down to Legions of Embedded Systems





# Convergence...

- ❖ Blurring the Lines between:
  - Devices (Hardware/Services)
  - Information (It's all reduced to IP Packets)
  - Applications (Software/Services)
  - Organizations (Forcing Reorganizations & Cooperation)
- ❖ Forcing Integration & the Seamless Flow of Information Between Processes & People

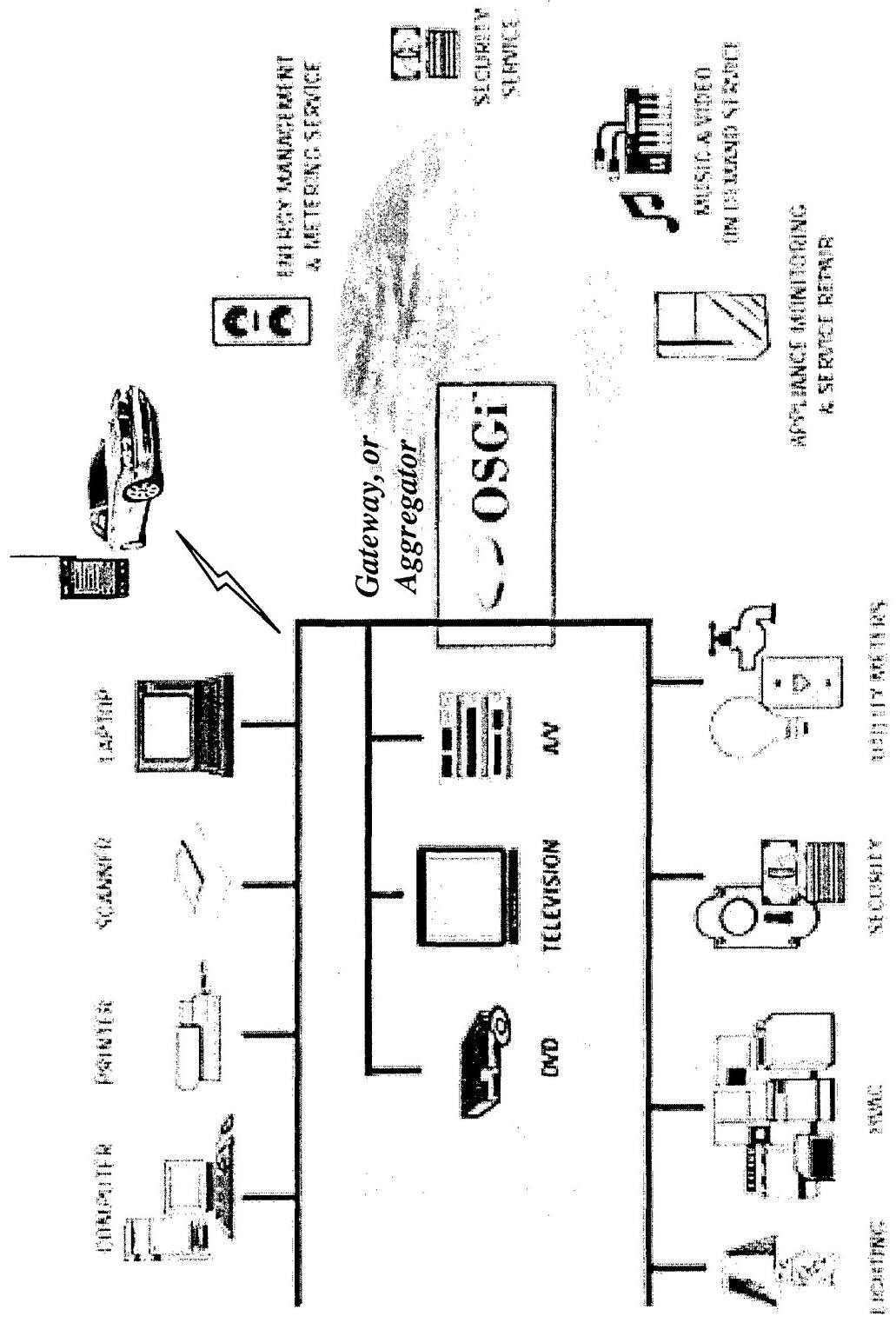
It's Changing the World



# The Open Services Gateway Initiative (OSGi)



UNITED STATES ARMY  
NATIONAL AUTOMOTIVE CENTER



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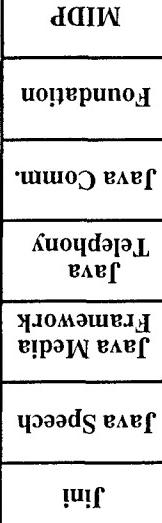
# Pervasive Device Software Architecture



**Applications & Services**  
*e.g., Diagnostics, Prognostics, Database, S/W Management, Security, etc.*

**Services Management Framework (OSGi)**

**Java Device Profiles & Libraries**  
...  
JNI



**Core Java Libraries (CDC<sup>1</sup>/CLDC<sup>2</sup>)**

**Java Virtual Machine (JVM)**

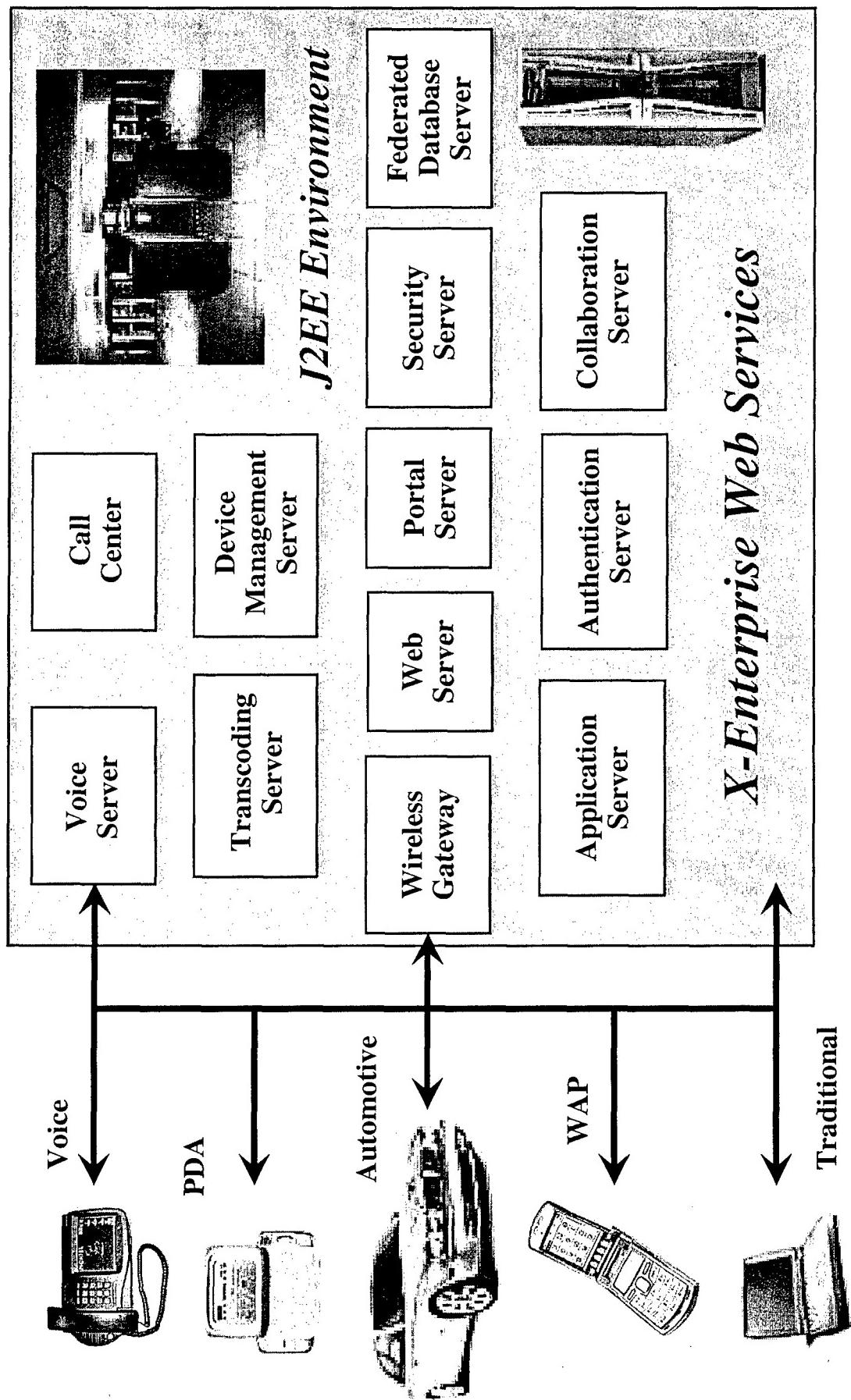
**RTOS**  
*(e.g., RT Linux, Neutrino, WinCE, pSOS, etc.)*

**Hardware**  
*(e.g., x86, PowerPC, Sparc, StrongARM, etc.)*

<sup>1</sup>: CDC: Connected Device Configuration

<sup>2</sup>: CLDC: Connected Limited Device Configuration

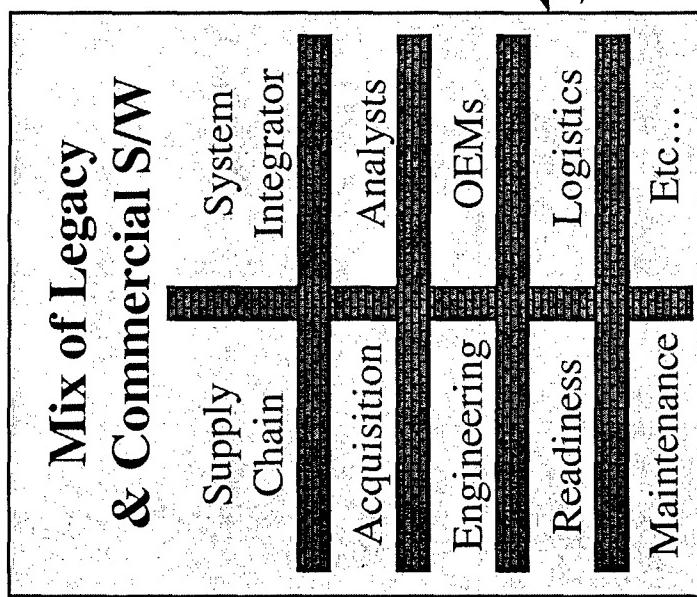
# Back-End PvC Architecture



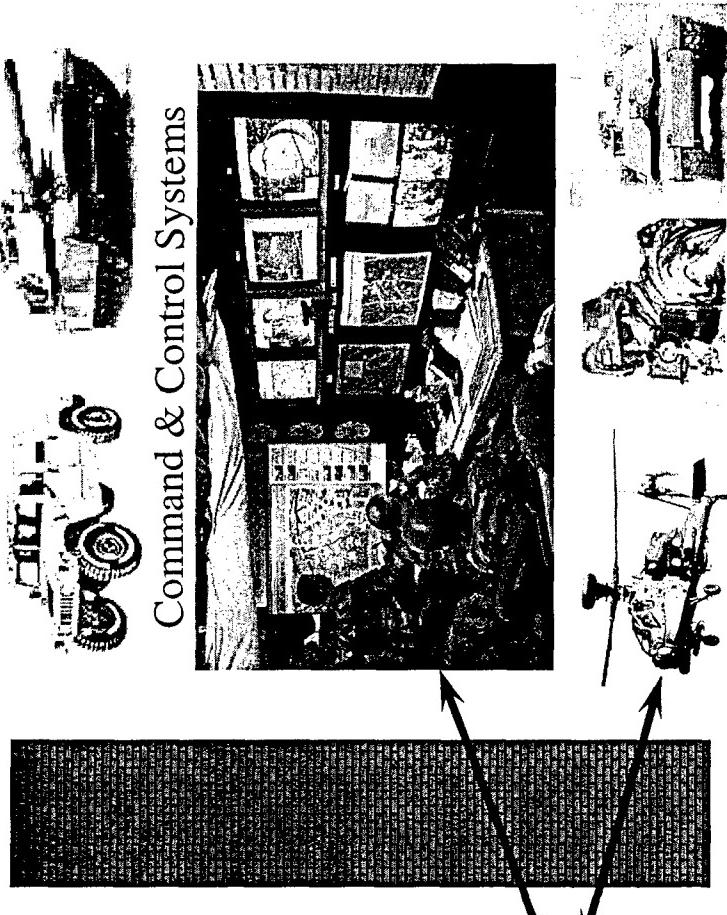
# Current Army Enterprise IT Architecture



## Enterprise Side



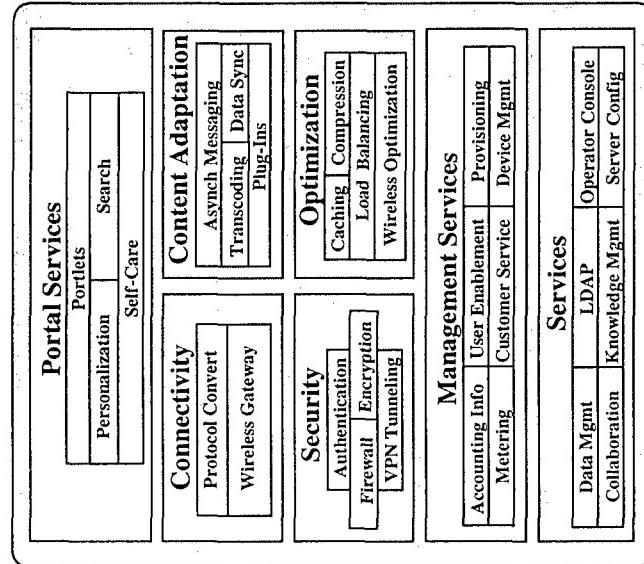
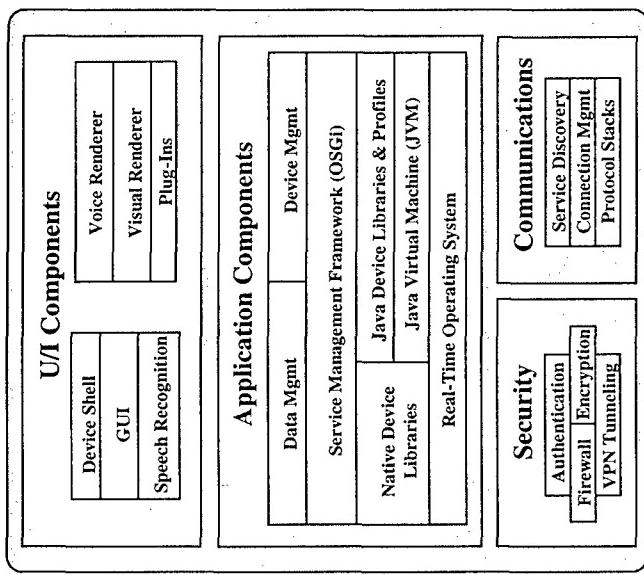
## Operational Side



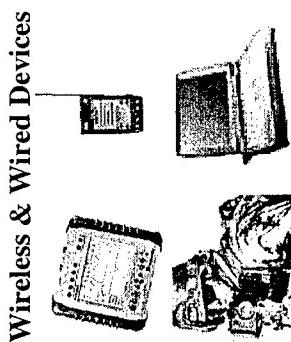
Need a Single Commercially-Based  
X-Enterprise IT Architecture



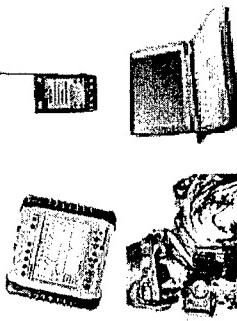
# Middleware: A Powerful Foundation Upon Which to Build!



*An Increasing Spectrum of Compute Platforms & Services*



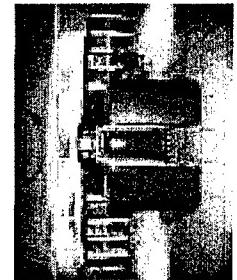
Wireless & Wired Devices



Static & Mobile 'Edge' Servers



Enterprise Systems

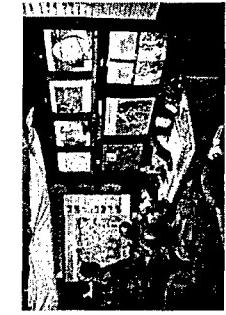
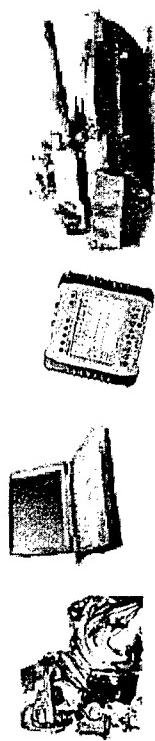


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# A Middleware Foundation

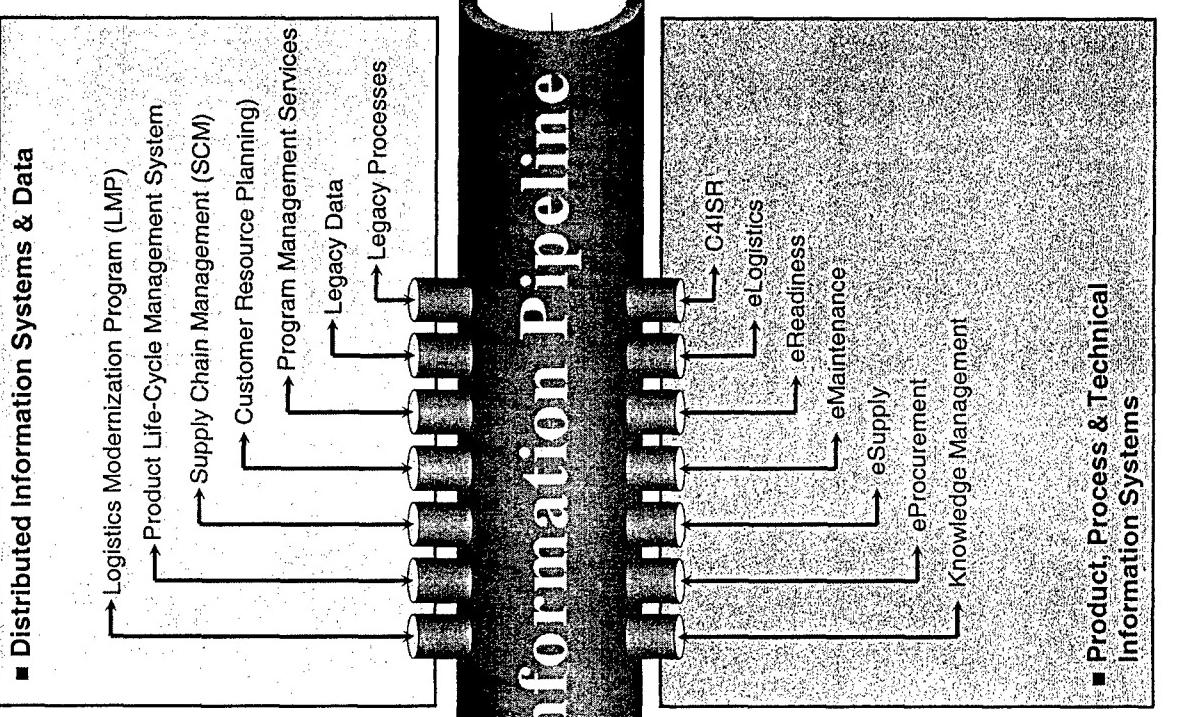
**Secure Access to  
Support, Data,  
Processes, Suppliers,  
etc.**



**Integration,  
Collaboration  
& Workflow  
Services**



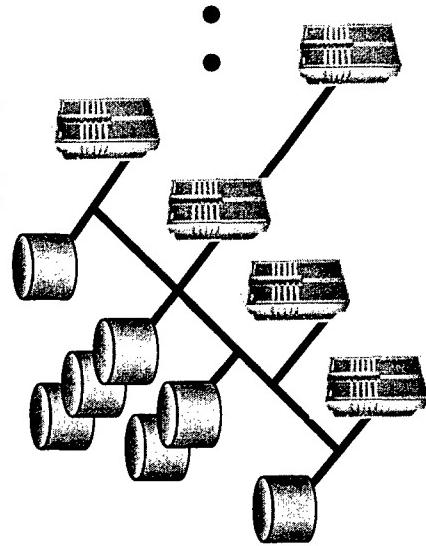
**Information Pipeline**





# Middleware Services

## Web Services Aggregators



- ❖ eProcurement
- ❖ eLogistics
- ❖ eMaintenance
- ❖ eReadiness
- • •
- ❖ eSupply
- ❖ eC4ISR, etc.

## Enterprise Software Stack:

- ❖ Middleware Services (Portal, App, etc.,)
- ❖ Message Queuing (TP),
- ❖ Network/Process Security & Management
- ❖ Wireless Gateway (Transport Abstraction)
- ❖ Grid & Autonomic Computing
- ❖ Storage Area Networks (SANs)
- ❖ Web Services
- ❖ Linux

Internet/Intranet  
Security/Authentication  
Software Management  
Data/Voice/Services

## Client-Side Stack:

- ❖ Java (J2ME)
- ❖ JVM
- ❖ OSGi SMF
- ❖ DA (Proc Mngr)
- ❖ MQe
- ❖ DBe
- ❖ Voice
- ❖ RT Linux
- etc...

## Any Client



# Enterprise IT

*Like the Borg it will:*

- ❖ Expand, Assimilate and Irrevocably Transform Information and Electronic Devices at all Levels and across all Army Organizations.

*Your Devices & Data Will be Assimilated.....*

*Resistance is Futile!*

